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Ottosen, Lisbeth M.; Bertelsen, Ida Maria Gieysztor; Charter, Martin; James, Neil

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Circular Ocean. Environmental challenges related to waste fishing nets and innovative use as resource in fiber-reinforced concrete

Lisbeth M. Ottosen*[1], Ida M.G. Bertelsen[1], Martin Charter[2], Neil James[3]

1: DTU Civil Engineering, Brovej, Building 118, Technical University of Denmark, 2800 Kgs. Lyngby
*Corresponding author email: lo@byg.dtu.dk

2: The Centre for Sustainable Design, University for the Creative Arts, UK

3: Environmental Research institute. North Highland College UHI (Scotland)

Marine plastic litter is a growing concern, and one particular troublesome marine waste fraction is discarded fishing gear. Increasing levels of marine litter is particularly pertinent to the Northern Periphery and Arctic region. The EU funded project Circular Ocean focuses on identifying possible use of the waste fishing nets in this region by acting as a catalyst to motivate and empower remote communities to develop sustainable and green business opportunities based of waste fishing nets as resource. A recent Circular Ocean report [1] based on unpublished national port-related feasibility studies focused on the collection and recycling of waste fishing nets and ropes. Among others, it was found that there is a very fragmented picture of the issues surrounding waste fishing nets and ropes in the region with little research completed to date. Additionally, there appears to be a lack of clear innovation eco-systems within port areas to enable the development of eco-innovative products from waste fishing nets and ropes.

To support increased use of the waste fishing nets, mechanical properties of PE and Nylon 6 waste fishing nets have been documented at DTU Byg. On basis of the findings different uses of these fibers in concrete have been suggested and experimentally investigated. The result is that PE can be used for increased durability by control of plastic shrinkage cracking, whereas Nylon 6 can be used for structural purposes, i.e. improvement of mechanical properties such as ductility (yet unpublished results).

Fig. 1: Waste fishing nets at dumpsite in Greenland - a resource as fibers to reinforce concrete?

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References

[1] Charter, M. (2017) summary of the findings of port-related feasibility studies related to the collection and recycling of waste fishing nets and ropes in Greenland, Ireland, Norway and Scotland. http://www.circularocean.eu/wp-content/uploads/2017/11/Circular-Ocean-Port-Reports-FINAL.pdf